Children's mortality from COVID-19 compared with all-deaths and other relevant causes of death

Dear Editor,

Children's mortality from COVID-19 compared with all-deaths and other relevant causes of death: epidemiological information for decision-making by parents, teachers, clinicians and policymakers

Governments are grappling with the challenge of returning societies to quasi-normal following "lockdowns" to control the COVID-19 pandemic. Policymakers, the public, and especially parents are understandably anxious about the implications of re-opening nurseries and schools. In Europe, Norway, Denmark, France and Germany have already re-opened schools. The UK government signalled its intention to do so from 1 June 2020 to vast unease and controversy amongst the public, not least from teachers' unions whose arguments against premature reopening have polarised opinion. Others have described "collateral damage" to children through social distancing measures[1] and questioned compatibility with the UN convention on the rights of the child.

While decisions about allowing children to exit their homes, and to restart schooling, are ultimately value judgements, we think that understanding current risks to children from COVID-19 can be aided through epidemiology and that this understanding should underpin decision-makers' and parents' views[2]. We accept that there is much to learn about this new disease, and that the virus is likely to change during the pandemic and add new complexities.

We synthesised information on COVID-19 in relation to other causes of death in line with a previous call for increased focus on age-specific mortality[3]. We examined mortality as an important outcome providing accurate data, while recognising that reports about a multisystem hyper-inflammatory state in children need investigation and may modify our conclusions in due course[4]. Fortunately, the number of hospitalisations and ICU admissions in children remains low[5].

We examined age-specific data on COVID-19 deaths which had been collated from official government sources for seven countries up to 8-19 May 2020[6]. These countries were chosen due to data availability and high burden of adult COVID-19 death. The data were first extracted by SB and then cross-checked by SB and JB together to ensure accuracy. We obtained estimated numbers of deaths from other causes from Global Burden of Disease estimates[7] except for influenza for which we examined official government statistical websites and extracted age-specific death counts for up to the last five years (2015-2019). To help to compare like-with-like we adjusted mortality counts to reflect a three-month time period (table 1).

For this time period, in these seven countries combined, 44 COVID-19 deaths were reported in 42,846 confirmed cases (this latter number is likely to be a massive underestimate; data were not available for France) in those aged 0-19 years (0-14 in USA). This compares with 13,200 estimated deaths from all-causes, including 1,056 from unintentional injury, and 308 from lower respiratory tract infection (107 from influenza). The situation in each country was almost identical, and in accordance with early data from China[8] i.e. COVID rarely kills children, even compared with influenza, against which many children are already vaccinated. Our data show that for mortality COVID-19 is like flu, or less severe, in children whilst being the opposite in adults.

Our analysis should help parents, teachers and policymakers to make important decisions and possibly feel reassured about the direct impact of COVID-19 upon children. Political leaders, communities, clinicians and parents should appreciate that the main reason we are keeping children at home and socially isolated is to protect adults. The ethics of this choice needs public debate. Adults,- especially those at increased risk, including those with comorbidities or the elderly, who are - in close contact with children, need shielding. In children, at least in this wave of the pandemic and hopefully in the future, COVID-19 is a comparatively rare cause of death. We need to maintain close

surveillance of COVID-19 in children in case this conclusion changes as the pandemic unfolds and the virus (SARS-CoV-2), evolves.

References

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8 Lu X, Zhang L, Du H, *et al.* SARS-CoV-2 Infection in Children. *N Engl J Med* 2020; **382**: 1663–5.

		Population	All Cause deaths		Unintentional injury deaths		LRTI deaths		Influenza deaths	Confirmed COVID-19 cases	COVID-19 deaths		COVID-19 deaths as % of all deaths
			n	per 100,000	n	per 100,000	n	per 100,000	n	n	n	per 100,000	
USA	0-4y	9,810,275	6503	32.83	522	2.63	159	0.80	46	4385	6	0.03	0.092%
	5-14y	41,075,169	1361	3.31	194	0.47	35	0.09	43	17523	7	0.02	0.514%
United Kingdom	0-9y	8,052,552	1034	12.84	34	0.42	34	0.42	4	972	2	0.02	0.193%
	10-19y	7,528,144	303	4.02	26	0.35	6	0.08	2	1245	9	0.12	2.975%
Italy	0-9y	5,090,482	428	8.41	17	0.32	11	0.21	5	1774	4	0.08	0.935%
	10-19y	5,768,874	211	3.65	20	0.34	3	0.05	3	3148	0	0.00	0.000%
Germany	0-9y	7,588,635	759	10.00	36	0.47	14	0.18	1	3172	1	0.01	0.132%
	10-19y	7,705,657	341	4.42	24	0.31	5	0.06	1	7350	2	0.03	0.587%
Spain	0-9y	4,370,858	373	8.54	20	0.45	9	0.21	1	857	2	0.05	0.536%
	10-19y	4,883,447	145	2.97	15	0.31	3	0.05	1	1591	5	0.10	3.448%
France	0-9y	7,755,755	795	10.25	58	0.75	13	0.16	NA	NA	3	0.04	0.377%
	10-19y	8,328,988	291	3.50	29	0.35	3	0.04	NA	NA	3	0.04	1.030%
Korea	0-9y	4,148,654	414	9.99	39	0.93	10	0.24	NA	143	0	0.00	0.000%
	10-19y	4,940,455	222	4.49	21	0.42	3	0.06	NA	614	0	0.00	0.000%
TOTAL		**137,326,595**	**13,200**	**9.62**	**1,056**	**0.77**	**308**	**0.22**	**107**	**42,846**	**44**	**0.03**	**0.333%**

Table 1: Age-specific data for seven countries showing population, estimated deaths from all and specific causes over three months, compared with COVID-19 cases and deaths from the beginning of the COVID-19 pandemic to early 8-19 May 2020 (see note 5 for exact date for country, which varies by reporting method)

NA= Not publicly available

Data Sources

1. **Population**: collated from national statistical agencies by The Demographics of COVID-19 Deaths, National Institute for Demographic Studies (INED). Available online: https://dc-covid.site.ined.fr/en/
2. **All cause deaths, unintentional injury deaths, LRTI deaths:** Calculated from Global Burden of Disease estimates. Available online: http://ghdx.healthdata.org/gbd-2017
3. **Influenza deaths:** Calculated for three-month period from mean number of deaths from up to last 5 year available from national statistical agencies, except USA which is actual data reported for period 1 Feb 2020 to 9 May 2020. Available online: https://www.cdc.gov/nchs/nvss/vsrr/covid_weekly/index.htm#AgeAndSex

4. **COVID-19 Cases:** USA from Centers for Disease Control. Available online: https://www.cdc.gov/nchs/nvss/vsrr/covid_weekly. United Kingdom from Public Health England. Available online: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/885150/COVID19_Weekly_Report_13_May.pdf. For Scotland (64 cases in 0-14 year olds; https://beta.isdscotland.org/find-publications-and-data/population-health/covid-19/covid-19-statistical-report/) and North Ireland (104 cases in 0-19 year olds; https://app.powerbi.com/view?r=eyJrIjoiZGYxNjYzNmUtOTlmZS00ODAxLWE1YTEtMjA0NjZhMzlmN2JmIiwidCI6IjljOWEzMGRlLWQ4ZDctNGFhNC05NjAwLTRiZTc2MjVmZjZjNSIsImMiOjh9) data not included as reported in different age brackets. Italy from: Istituto Superiore di Sanità. Available online: https://www.epicentro.iss.it/coronavirus/bollettino/Bollettino-sorveglianza-integrata-COVID-19_14-maggio-2020.pdf. Germany from: Robert Koch Institut. Available online: https://www.rki.de/DE/Content/InfAZ/N/Neuartiges_Coronavirus/Situationsberichte/2020-05-13-en.pdf. Spain from Ministerio de Sanidad, Consumo y Bienestar Social. Available online: https://www.mscbs.gob.es/profesionales/saludPublica/ccayes/alertasActual/nCov-China/documentos/Actualizacion_104_COVID-19.pdf.
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